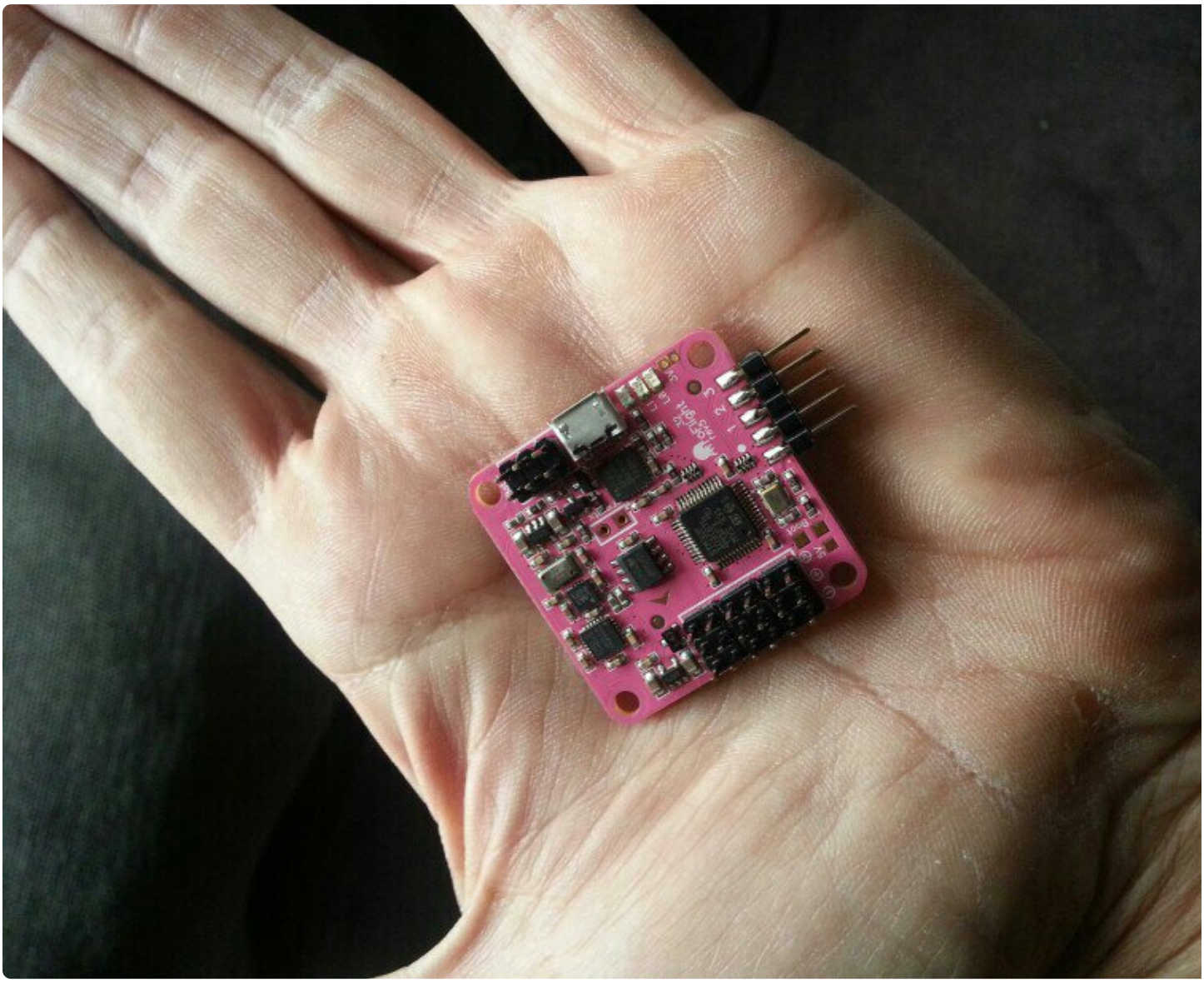
The Best Flight Controllers For FPV Drones

29th January 2022



Speed up construction

Track your building's carbon footprint, and cut waste in the construction value chain. 3ds.com

Yuneec H520E Wärmebild Jagd

Die passende Drohne mit Wärmebild für Jagd u
Kitzrettung. Die Yuneec H520E Drohne

copterpro.de

Further Reading:

- Flight Controller Buyer's Guide
- FC Firmware Overview

What key features to look for in flight controllers:

- Using either F4, F7 or H7 processors, preferably F7 and H7 as they are faster, more future-proof doesn't care about signal inversion when dealing with Frsky receivers
- MPU6000 Gyro is still the preferred gyro, since Betaflight only supports up to 8K now, no need fo but noisier gyro; ICM gyros are generally okay if they are soft-mounted
- Supports wide range of input voltage, preferably up to 6S
- Provides soft mounting solution, such as using silicone grommets

Table of Contents

1. Mamba MK4 H743 Stack – Versatile and Complete Package
2. Flywoo GOKU GN745 – Most Feature-Rich Toothpick Style Board
    2.1. Rush F7 Mini Stack – Great 20x20mm Stack
3. Diatone Mamba F405 DJI – Cheapest Worth Having Stack

Mamba MK4 H743 Stack – Versatile and Complete Package

The Diatone Mamba MK4 H743 is a great FC/Stack for both DJI FPV system and analogue FPV syste

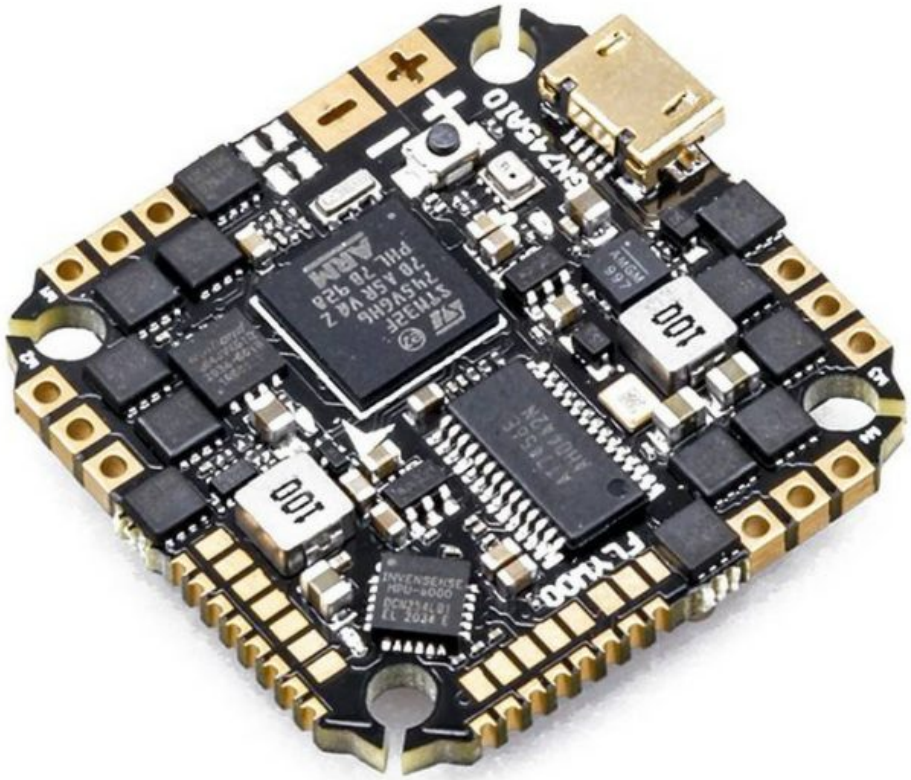
It uses the latest and greatest H7 processor. It has all the standard features you'd want in a Betaflight controller, including lots of UARTS (8 of them!) and flash memory for Blackbox logging.

Additionally, it has a built-in LED control system that allows you to control RGB LED's without using Betaflight's complicated LED interface. You can change LED colours by simply pressing a button on th

The solder pad layout is super clean and user friendly too. Take a look at my review to learn more abo FC.

Sometimes when you buy the FC and 4in1 ESC from different manufacturers, the wiring can get mess because the pin-out's might be different. That's why I'd recommend getting a stack and you know you going to be "plug-n-play" and fully compatible. You can get the Mamba MK4 H743 together with a 55A 4in1 ESC, which will save you many headaches.

Flywoo GOKU GN745 – Most Feature-Rich Toothpick Style Boa



Product Page:

- **GetFPV:** **https://oscarliang.com/product-1f9n**
- **RDQ:** **https://oscarliang.com/product-4zy4**

The GOKU GN745 is great for light weight 4″ and 5″ FPV drone builds.

ably one of the most feature-rich whoop/toothpick style FC out there. You will be blown away t

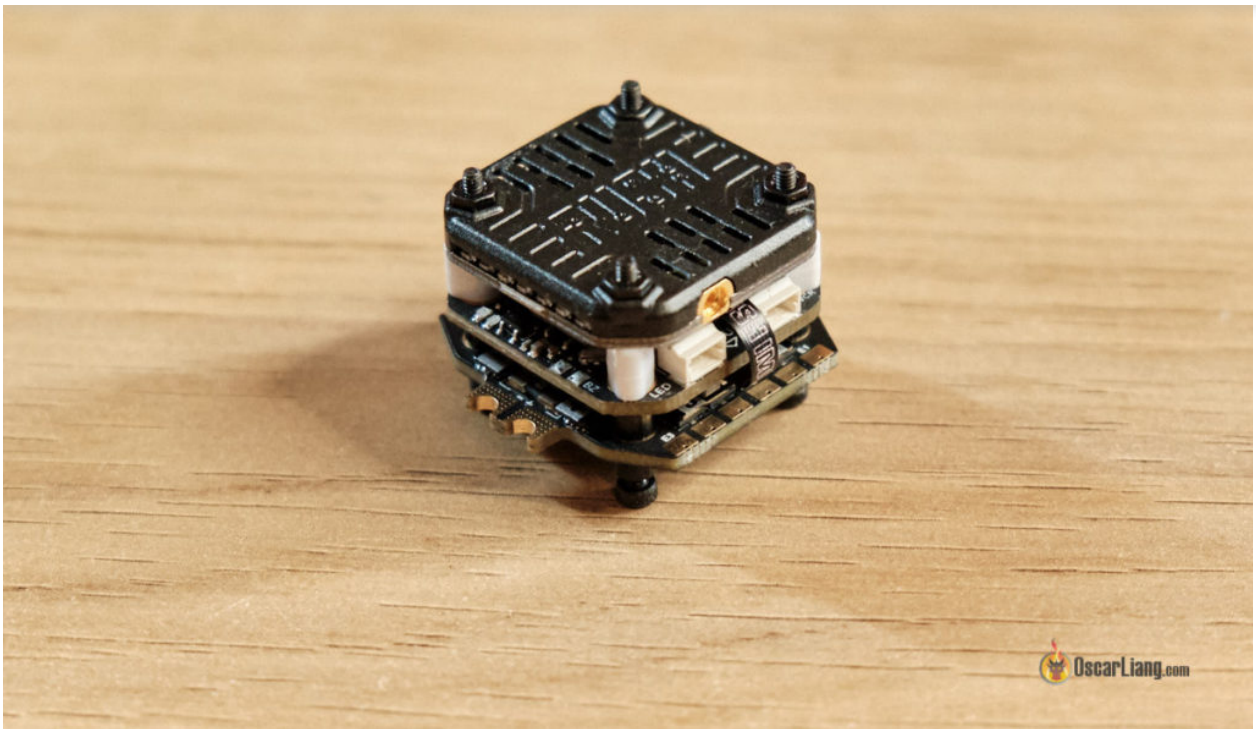
FC Specs:

- STM32F745 MCU
- MPU6000 Gyro
- Barometer: BMP280
- 7 hardware UARTS (UART1,2,3,4,5,6,7)
- Onboard 8MB flash memory for Blackbox logging
- 9V 1.5A BEC
- 5V 2.0A BEC
- 3.3V 0.5A BEC
- Onboard RGB LED: WS2812*4 (can be programmed in Betaflight)
- Mounting Holes: Standard 25.5/26.5mm mounting pattern
- Dimensions: 33.5×33.5mm
- Weight: 8.5g

Built-in ESC Specs:

- Input Voltage: 2-6S Lipo
- BLHELI_32 ESC
- Continuous Current: 40A per motor
- Support PWM, Oneshot125, Oneshot42, Multishot, Dshot150, Dshot300, Dshot600,Dshot1200

Rush F7 Mini Stack – Great 20x20mm Stack



Product Page:

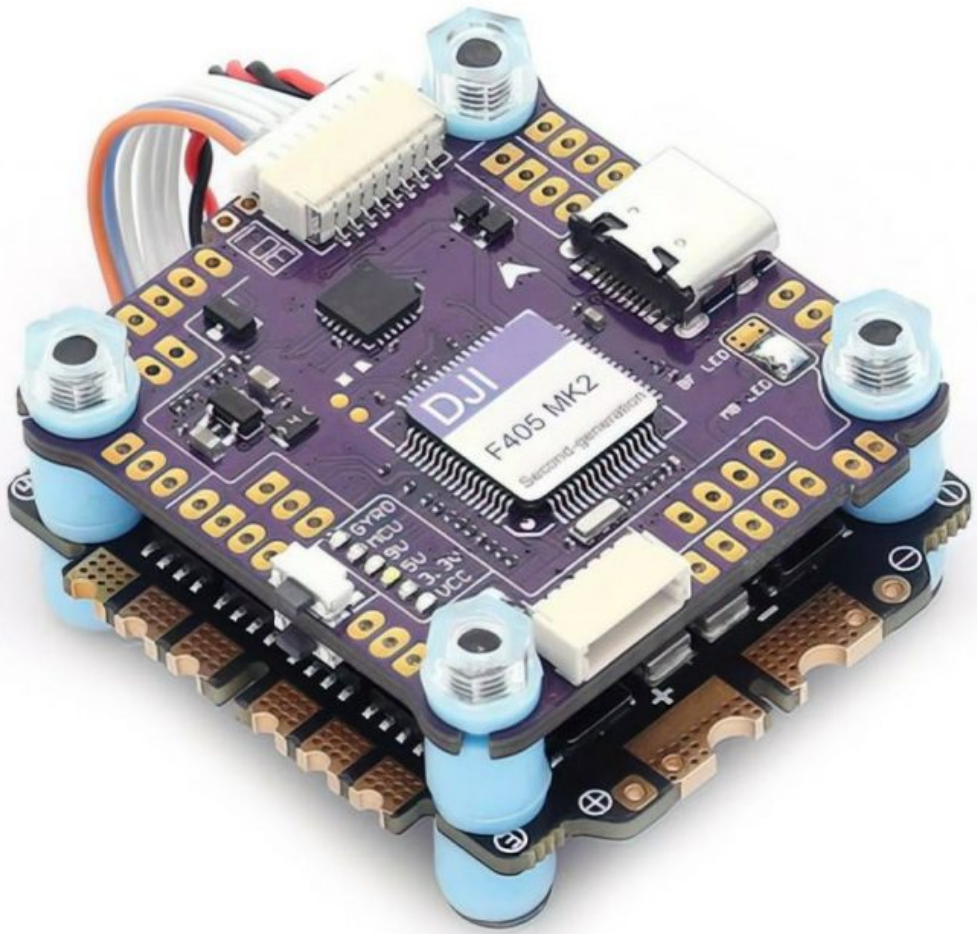
- **RDQ**
- **Banggood**
- **GetFPV**
- **Amazon**

If you have a frame that requires 20x20mm stack, or you just want a compact FC solution to go in your the Rush F7 Mini stack is a good option.

Most of the flight controllers we have talked about are “full size” 30x30mm boards. The Rush F7 Mini S has a 20x20mm mounting pattern, which is considerably smaller.

t the compact form factor fools you, it has the exact same performance and capability as any fu

Diatone Mamba F405 DJI – Cheapest Worth Having Stack



Product Page:

- **FC with BLHeli_S ESC (GetFPV): https://oscarliang.com/product-nh4g**
- **with BLHeli_S ESC (RDQ): https://oscarliang.com/product-si7v**

FPV system as it has onboard Betaflight OSD chip. But yes, it's "plug n play" with DJI FPV system.

FC Specs:

- STM32 F405 Processor
- MPU6000 Gyro
- 3.3V 0.5A BEC
- 5V 3A BEC
- 9V 3A BEC (for DJI FPV system)
- Blackbox: 16MB Flash Memory
- TVS Protection: Yes
- Built-in Barometer
- 6 UART's
- OSD: Yes
- MOUNTING: 30.5mm, M3
- Input: 3~6S Lipo (12.6~25.2V)

Same as the more expensive Mamba H743, the MK2 F405 also has a built-in RGB LED controller. A p the button on the FC will change the colour of the LED's. (only useful if you are into putting LED on yo drone though)

As explained in my FC Processor article, F4 is quite a bit slower than F7 and H7 processors, I don't re recommend F4 anymore if you are getting a new FC today. That's because the lack of resources and eventually Betaflight will phase out F4 FC (or strip certain features to save resources), but we have no when that day will come yet, so you can still safely use this FC. It's a good stack if you want something inexpensive that will get the job done.

- Aug 2018 – List updated – Kakute F7, Fireworks V2
- Dec 2018 – Updated CL Racing F4S with F7
- Sep 2019 – Updated
- July 2020 – Updated, added options for DJI FPV system
- Jan 2022 – Updated products

FC FLIGHT CONTROLLER RECOMMEND TOP 5 BEST

previous post
The Best VTX (Video Transmitter) for FPV Drones

r
The Best ESC for FP

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Email*

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website. Note that all comments are held for moderation before appearing.

SUBMIT

Hi,

I'm in the process of building a Bi-rotor (Avatar Scorpion gunship)

Im looking for a decent flight controller to facilitate this. Do you please have any recommen

DEVASHISH

6th January 2022 - 3:01 am

Hey Guys,

I want to build a new FPV drone from scratch with all advance features in it andd it is budge friendly. Can you please guide me which parts I need to purchase because I don't get any p idea about this.

Thanks in advance.

KEN BLOCK

2nd September 2021 - 6:43 pm

Thoughts on these two stacks?

banggood.com/MAMBA-F405-Mini-MK2-Betaflight-F4-Flight-Controller-and-F30-30A-or-25 DSHOT600-FPV-Racing-Brushless-ESC-2020mm-for-RC-Drone-FPV-Racing-p-1345002.html?rmmds=detail-topright-recommendation&cur_warehouse=CN

Both would be used with a 4s/6s 5″

BUD

24th January 2021 - 7:25 pm

The CLRacing F7 V2 DAUL FC may be one of the best. But, I'm reluctant to purchase. Cus support has not been very responsive to emails.

EDUARDO LEGNAIOLI FACCHIOLI

17th September 2020 - 5:21 pm

Hello, could you please add some matek in this comparison? Thank you

JON

5th September 2020 - 2:39 am

Awesome article! I do have a question though. Do you have and recommendations for an a with a pdb for individual escs that also has the dji plug?

OSCAR

29th September 2020 - 10:18 pm

Currently there is no AIO FC with DJI plug afaik. I think the industry is moving awa AIO FC now as 4in1 ESC is main stream.

EG TREADWAY

3rd August 2020 - 3:55 am

I've been following you for long time so thanks for all your knowledge, I think I have damag and rx4 on my f405-wing while soldering pins for my gps with build in compass, I don't see traces going to either port I wondering if I could use tx6 and rx6 instead and everything wor not sure if I need compass or not with this board on fixed wing drone. Thanks again

SHANE TASH

18th July 2020 - 3:17 pm

23rd October 2019 - 8:39 pm

Hello Oscar,
Would you know which is the best FC to use with the DJI Ocusync FPV cam?
Thanks!

UJJWAL PIPREWAR

24th December 2018 - 7:26 am

Hi i am a beginner. And I am not into fpv at the beginning. Actually i am having a major con in choosing the best flight controller for my 250mm quadcopter which will give me very stab controlled flight. Our competition are basically like we have obstacles at a distance of 1 ft a have to pass through them. So basically flight board shoulf give us more control over the quadcopter. My friends recommended me omnibus f4 is more stable and does not require r changes in PID settings but which omnibus f4 they didn't told and there are many versions What do you recommend? Please do tell as fast as possible also it should not cost much.

RON AILER

1st December 2018 - 1:58 am

My thoughts on best FC is simple and thats one that works. Every pilot should know their o level and what fc would suit their needs best. I think FC's should come in simple , advance expert. Also it would be nice if the hobby supply chain actually knew what a recall is instead knowing something is crap but just let it keep selling as was my recent experience when I purchased a CLRacing F4s being led to believe they were such a great board and what I re was obviously old stock V1.4 and got stuck with the roll of death. I then purchased the chea omnibus f4 from banggood and I now have a quad that actually flies without uncontrollably the dirt. Product developers have to step up and recall their products when they know they problem or people will will simply not buy their product again. I know I personally will not bu

20th January 2019 - 9:12 pm

Will you help me out in configuring mine?

TEAMSCREAM

5th March 2019 - 1:21 am

HI Oscar, I really like ALL of your info, and am extremely grateful that you take the share it with the rest of the world.
The one thing I find very frustrating however, is that you do not put a date anywher any of your blog posts, so I have no idea if this article was written in 2019, 2018 or Do you have any plans to perhaps put a date/time stamp somewhere on your entri we can know if the information is current or not?
Thanks again sir.

OSCAR

5th March 2019 - 2:02 am

Scroll down to the end, you will see the update history.

MARC

4th November 2018 - 6:10 pm

Hey Oscar,
i tried to build a QC myself with a MultiWii CRIUS 2.5, but still can't get it to hover steady. A errors are "unstable" and varying, i want to test with another FC.
Can you give me a recommendation for an "easy" FC that will work with an old 35MHz PW Receiver and 40A-SimonK-ESCs?
A 5V output for the Rx would be nice (no BEC on ESCs), but not mandatory.

26th September 2018 - 8:16 pm

I am putting together (or purchasing a pre-built armattan) quad for freestyle. My question is regarding the FC choice armattan uses on their ready-to-fly builds, they use a CL Racing F Is there any reason not to use a CL “racing” FC for freestyle?

OSCAR

1st October 2018 - 4:53 pm

It’s not limited to Racing, it’s just how they decided to name the product.

NEOLKER

24th August 2018 - 7:00 am

Miss here DYS F4 PRO V2, love 9 V BEC for VTX and video for crystal clear view.

BILS0N

7th August 2018 - 3:53 pm

Kakute F4 v2 “Furthermore, you cannot stick anything on top of the FC with things like a re or VTX.”
Why not? I have matek VTX mounted on top of the Kakute and it works fine and flies beaut

OSCAR

11th August 2018 - 4:18 pm

i mean directly on top without standoffs.

OBINNA NDU

one of the same kind and still nothing…. I did notice that you mentioned that some esc's w compatible with it…. could that be my problem?…..please help!!

OSCAR

12th June 2018 - 2:38 pm

Check in Betaflight to see what the "Arming Disable Flag" is, and then look it up to what the reason is?

LOGAN

29th November 2018 - 4:48 am

I'm actually having the same problem with my CLR F4S as well~
Also, I'm not sure if I've got a burnt out M4 pad, but it looks like I'm not ge motor 4 even when I've remapped it to another pad like cam-control. Any

MORITZ BEYER

3rd February 2018 - 10:08 am

Hello I am a Newbie,
I want to built my first mini quad, which qualifies for races and lets me grow. I read your gre articles but information from the manufacturer is low.
I want a 32khz Gyro, F4 Flight Control, OSD, DSHOT 1200, Voltage and Current monitor.
I want to use Betafly.
Does my proposed combination work and deliver just that?
– Omnibus F4 Corner Nano FC ICM20608
– Racerstar Tattoo_S Mini 25A 4 IN 1 ESC 2-4S Blheli_32bit Dshot1200
– FURIOUSFPV Innova V4 25/200mW OSD – VTX

sounds good to me.

But to be honest i think getting an FC with MPU6000 and run 8k is a much more re option.

MARC

19th August 2018 - 8:58 am

helio spring v2

airbot typhoon v2 / tekko32

seems better to me

OYB_71

28th January 2018 - 10:25 pm

need to update the Revolt FC info, there's a new due which has a on board 5V BEC and O

LAWRENCE

27th January 2018 - 8:47 pm

What about the JBARDWELL F4 AIO flight controller?

OSCAR

29th January 2018 - 1:16 pm

Not sure, our team haven't tried it yet. But it looks like to have good layout.

MATT

24th August 2018 - 4:34 pm

17th January 2018 - 8:45 pm

DYS released a v2 fc with corner pads and a connector to esc, not pads.

GLIDERBOY

17th July 2017 - 4:14 am

My favorite is missing, SirinFPV FC/VTX/BF OSD is cleanest possible minimalist package. mine with 4in1Aikon ESC. Has all essentials as long as you think it makes better sense to current sensing on the bench under controlled conditions

ROBERT KOSICK

9th July 2017 - 2:26 pm

Just a general complaint. To all FC makers. Instead the classic IT WORKS GET IT ON THE MARKET! Why don't you fully developed these boards before running your greed to the ba anyone wants is a standardized FC that you don't need a degree to operate! Thank you.

ANONYMOUS

17th July 2017 - 3:47 pm

New to multicopters?

That's been the culture of every drone vendor, even DJI, heck even X UFO (asctec even the military since the inception of commercial drones. For example, it took dji versions (and lots of crashes) to get to mikrokopter flight quality…. or course at 1/2 price.

It's going to be a rush to sell features, and make it CHEAP. reliability/usability takes seat.

cars that have bluetooth, built-in navigation, side and backup cameras, se
warmers, self-inflating tires, and transmissions that randomly seize.

OLE

22nd March 2017 - 9:45 pm

Regarding F4 and smartport, you should be able to use softserial as uart for smartport and
therefore you can inverted in software instead of modifying receiver og buying / making an
In doing this on my Airbot F4

JAMES DICKLOW - CT WILD FLYERS

22nd March 2017 - 9:11 pm

Little disappointed that the BrainRE1 wasn't on the list. It's the best one I've used and I nov
of them!

OSCAR

24th March 2017 - 12:55 am

unfortunately the list is based on a poll :(But for sure the BrainFPV RE1 is a great
which we reviewed before: review link

JEFF G

19th March 2017 - 2:10 pm

Is anyone familiar with the fpvstyle f3 evo flight control board?? I got it for only 20 but did g
paper work or screws etc and was just wondering if anyone has any knowledge on this boa
Hope to hear back from someone, jeff g

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